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**REMARKS**

Examiner's comments in the Office Action dated August 10, 2004 have been carefully considered by Applicants. In view of such comments, Applicants have amended the claims as set forth hereinabove. In particular, previously presented claims 1 through 20 have all been amended to better highlight the patentable differences of Applicants' proposed invention as compared to the prior art cited and interpreted by Examiner in the Office Action. In making such amendments, Applicants maintain that no new matter has been introduced into the present Application. Furthermore, no claims have been altogether cancelled, and no entirely new claims have been added. Thus, claims 1 through 20 now remain pending in Applicants' present Application. It is Applicants' good faith belief that the pending claims, as amended and set forth hereinabove, are both novel and non-obvious. Therefore, Applicants respectfully maintain that the pending claims now place the present Application in condition for allowance and notice thereof is respectfully requested.

In addition to amending the claims, Applicants have also amended some of the text within the specification as shown hereinabove. In particular, in paragraph 0032 of the specification, Applicants have made some textual amendments so as to properly distinguish between a first embodiment spacing distance "d1" in Figure 4 and a second embodiment spacing distance "d" in Figures 5 and 6. Also in paragraph 0032, Applicants have made some textual amendments so as to properly distinguish between the input surface "60" of a wedge-shaped coupling element 52 in a first embodiment of Applicants' proposed invention (see Figure 3) and the input surface "80" of a wedge-shaped coupling element 52 in a second embodiment of Applicants' proposed invention (see Figures 5 and 6). In making these textual amendments, Applicants respectfully maintain that no new matter has been added to the Application.

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**35 U.S.C. § 103(a)**

In the Office Action, independent claims 1, 4, 6, 13, and 18 and dependent claims 2, 3, 5, 7-12, 14-17, 19, and 20 stand rejected under 35 U.S.C. § 103(a) as being obvious and therefore unpatentable over United States Patent Number 6,028,722, issued to Lang on February 22, 2000 (hereinafter "Lang"), in view of United States Patent Number 5,513,289, issued to Hosokawa on April 30, 1996 (hereinafter "Hosokawa"). Applicants respectfully traverse each of these 35 U.S.C. § 103 rejections set forth in the Office Action in view of the claims as amended, for Applicants' invention as presently claimed is deemed not merely an obvious improvement over the prior art cited by Examiner.

With general regard to Examiner's rejections under 35 U.S.C. § 103, Applicants respectfully maintain that rejection for obviousness must be based upon objective evidence of record and requires that particular findings be made as to why a skilled artisan with no knowledge of the claimed invention would have selected the specific components for combination in the manner claimed. Thus, in order for any prior art references themselves to be validly combined for use in a prior art obviousness rejection under 35 U.S.C. § 103(a), the references themselves, or some other piece of prior art, must suggest that they be combined. In re Sernaker, 217 U.S.P.Q. 1, 6 (C.A.F.C. 1983). That is, the suggestion to combine the references must not come from Applicants' proposed invention itself. Orthopedic Equipment Co. v. United States, 217 U.S.P.Q. 193, 199 (C.A.F.C. 1983). In sum, in order to establish a *prima facie* case of obviousness, it is necessary to present evidence, in the form of some teaching, suggestion, incentive, or inference in the applied prior art, or in the form of generally available knowledge, that one having ordinary skill in the art would have been led to combine the relevant teachings of the applied references in the proposed manner to arrive at the claimed invention. Ex parte Levengood, 28 U.S.P.Q.(2d) 1300 (P.T.O.B.A.&I. 1993).

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With regard to the obviousness rejection of independent claim 1, Applicants maintain that the combination of Lang and Hosokawa does not render obvious Applicants' claimed invention. In particular, with regard to Applicants' independent claim 1 as amended, Lang and Hosokawa, either alone or in combination, neither teach nor suggest:

[a] light coupling apparatus for coupling a linear diode laser array to an optical fiber, said light coupling apparatus comprising:

a wedge-shaped coupling element including an input surface and an output surface, said coupling element having a height (h) substantially equal to a length defined by said linear diode laser array, and said coupling element having a length (L) extending from said input surface and to said output surface;

wherein said input surface receives emitted light directly from a plurality of diode lasers within said linear diode laser array, said input surface has a first width (w1) faceted in a direction along said height (h) to direct said light towards said output surface having a second width (w2), and said input surface is curved in a direction perpendicular to said height (h) to substantially collimate said light.

In Lang, an optical delivery system (see Figures 20 and 25) is taught for optically preparing and delivering light to a converging lens system (numerically designated 80 in Figure 25) which ultimately delivers light into an input end of an optical fiber. (Lang, column 6, lines 27-30, 42-44; column 13, lines 38-57; and column 15, lines 1-10). In all inventive embodiments disclosed or taught in Lang, the optical delivery system includes a semiconductor laser array or bar (numerically designated 51 in Figure 20, 66 in Figures 21 and 22, and 76 in Figure 23), multiple lenses (designated 53 and 54 in Figure 20, 63 and 64 in Figures 21 and 22, and 73 in Figure 23) for collimating light received from the laser array or bar, and an optical handling system 50 comprising a beam reconfiguring device (designated 10 or 20) for reconfiguring light received from the multiple lenses before delivering the light to the converging lens system 80. (Lang, column 13 lines 38-67; column 14, lines 1-67; column 15, lines 1-10; and Figures 20-23, 25). As taught by Lang, the beam reconfiguring device 10 or 20 includes at least one prism element (for example, an input prism 55 and an output prism 56 as in Figure 20) for reconfiguring light received from both the laser array or bar and the multiple lenses

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so that the light can be better converged into a single, substantially symmetrical spot for input into an optical fiber. (Lang, column 13, lines 38-67; column 14, lines 1-12, 38-41, 63-67; column 15, lines 1-10; and Abstract). In sum, therefore, Lang does not teach a light coupling apparatus comprising a wedge-shaped coupling element that includes an input surface for receiving emitted light directly from a plurality of diode lasers as claimed and required in Applicants' independent claim 1. Instead, Lang teaches a converging lens system 80 that indirectly receives light from a laser array or bar via multiple lenses and a beam reconfiguring device 10 or 20. Such a teaching by Lang is contrary to the purpose and intent behind Applicants' invention of avoiding the need to precisely position and align multiple lenses and optical elements. (Applicants, ¶ 0010; and ¶ 0033). In Hosokawa, an optical device and an optical device manufacturing method is taught. As with Lang, however, Hosokawa too does not teach a light coupling apparatus comprising a wedge-shaped coupling element that includes an input surface for receiving emitted light directly from a plurality of diode lasers, as claimed and required in Applicants' independent claim 1. Therefore, Lang and Hosokawa, either alone or in combination, neither teach nor suggest Applicants' invention as presently claimed in independent claim 1.

In view of the disparate teachings of both Lang and Hosokawa discussed hereinabove, Applicants respectfully maintain that the combination of Lang and Hosokawa does not render obvious Applicants' invention as presently claimed in independent claim 1. Furthermore, given that claims 2 and 3 are dependent on independent claim 1, Applicants further maintain that the subject matter of dependent claims 2 and 3 is not rendered obvious either.

With regard to the obviousness rejection of independent claim 4, Applicants maintain that the combination of Lang and Hosokawa does not render obvious Applicants' claimed invention. In particular, with regard to Applicants' independent claim 4 as amended, Lang and Hosokawa, either alone or in combination, neither teach nor suggest:

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[a] method of coupling the output of a linear diode laser array into an end of an optical fiber, said method comprising the steps of:

directly optically coupling along a linear axis spaced at a distance (d) from said linear diode laser array a wedge-shaped coupling element having a height (h) substantially equal to a length defined by said linear diode laser array, said coupling element receiving emitted light directly from a plurality of diode lasers within said linear diode laser array and directing said light toward an output surface having a second width (w2) by way of an input surface having a first width (w1) faceted in a direction along said height (h) and curved in a direction perpendicular to said height (h); and

optically coupling light from said output surface and into an end of the optical fiber, said optical fiber having a diameter substantially equal to said second width (w2).

As alluded to hereinabove, Lang does not teach a wedge-shaped coupling element receiving emitted light directly from a plurality of lasers, as claimed and required in Applicants' independent claim 4. Instead, Lang teaches a converging lens system that indirectly receives light from a laser array or bar via multiple lenses and a beam reconfiguring device. Again, such a teaching by Lang is contrary to the purpose and intent behind Applicants' invention of avoiding the need to precisely position and align multiple lenses and optical elements. (Applicants, ¶ 0010; and ¶ 0033). As with Lang, Hosokawa too does not teach a wedge-shaped coupling element receiving emitted light directly from a plurality of diode lasers, as claimed and required in Applicants' independent claim 4. Therefore, Lang and Hosokawa, either alone or in combination, neither teach nor suggest Applicants' invention as presently claimed in Independent claim 4.

In view of the disparate teachings of both Lang and Hosokawa discussed hereinabove, Applicants respectfully maintain that the combination of Lang and Hosokawa does not render obvious Applicants' invention as presently claimed in independent claim 4. Furthermore, given that claim 5 is dependent on independent claim 4, Applicants further maintain that the subject matter of dependent claim 5 is not rendered obvious either.

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With regard to the obviousness rejection of independent claim 6, Applicants maintain that the combination of Lang and Hosokawa does not render obvious Applicants' claimed invention. In particular, with regard to Applicants' independent claim 6 as amended, Lang and Hosokawa, either alone or in combination, neither teach nor suggest:

[a] light coupling apparatus for coupling a linear diode laser array to an optical fiber, said light coupling apparatus comprising:

a cylindrical lens positioned adjacent and substantially parallel to the linear diode laser array, said cylindrical lens having a length substantially equal to a length of said linear diode laser array, said cylindrical lens receiving emitted light from a plurality of diode lasers within said linear diode laser array and collimating said light; and

a wedge-shaped coupling element situated between said cylindrical lens and said optical fiber, said coupling element including an input surface and an output surface, said coupling element positioned adjacent said cylindrical lens for thereby receiving collimated light directly from said cylindrical lens via said input surface, said coupling element having a length (L) extending from said input surface and to said output surface, said coupling element having a height (h) and said input surface having a radius of curvature along said height (h), said height (h) being substantially equal to said length of said cylindrical lens, said coupling element tapering from said input surface and to said output surface, said input surface having an associated first width (w1) and said output surface having an associated second width (w2), said first width (w1) being substantially equal to a diameter of said cylindrical lens, and said second width (w2) being substantially equal to a diameter of said optical fiber.

More particularly, Lang does not teach a light coupling apparatus comprising a cylindrical lens along with a wedge-shaped coupling element that is positioned adjacent the cylindrical lens for thereby receiving collimated light directly from the cylindrical lens, as claimed and required in Applicants' independent claim 6. Instead, Lang specifically teaches interposing an optical beam reconfiguring device (designated 10 in Figure 20 of Lang) between a cylindrical lens (designated 53 in Figure 20, 63 and 64 in Figures 21 and 22, and 73 in Figure 23 of Lang) and a converging lens system (designated 80 in Figure 25 of Lang). Such a teaching by Lang is contrary to the purpose and intent

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behind Applicants' invention of avoiding the need to precisely position and align multiple lenses and optical elements. (Applicants, ¶ 0010; and ¶ 0033). As with Lang, Hosokawa too does not teach a light coupling apparatus comprising a cylindrical lens along with a wedge-shaped coupling element that is positioned adjacent the cylindrical lens for thereby receiving collimated light directly from the cylindrical lens, as claimed and required in Applicants' independent claim 6. Therefore, Lang and Hosokawa, either alone or in combination, neither teach nor suggest Applicants' invention as presently claimed in independent claim 6.

In view of the disparate teachings of both Lang and Hosokawa discussed hereinabove, Applicants respectfully maintain that the combination of Lang and Hosokawa does not render obvious Applicants' invention as presently claimed in independent claim 6. Furthermore, given that claims 7-12 are dependent on independent claim 6, Applicants further maintain that the subject matter of dependent claims 7-12 is not rendered obvious either.

With regard to the obviousness rejection of independent claim 13, Applicants maintain that the combination of Lang and Hosokawa does not render obvious Applicants' claimed invention. In particular, with regard to Applicants' independent claim 13 as amended, Lang and Hosokawa, either alone or in combination, neither teach nor suggest:

[a] lighting apparatus comprising:

a linear diode laser array comprising a plurality of spaced-apart diode lasers each emitting divergent laser light;  
a cylindrical lens positioned at a first distance (d1) from and substantially parallel to said linear diode laser array, said cylindrical lens having a length substantially equal to a length defined by said plurality of diode lasers, said cylindrical lens receiving emitted light from said plurality of diode lasers and collimating said light; and

a wedge-shaped coupling element having an input surface and an output surface, said coupling element positioned at a second distance (d2) from said cylindrical lens for thereby receiving collimated light directly from said cylindrical lens via said input surface, said coupling element having a length (L) extending from said input surface and to

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said output surface, said coupling element having a height (h) and said input surface having a radius of curvature along said height (h), said height (h) being substantially equal to said length of said cylindrical lens, said coupling element tapering from said input surface and to said output surface, said input surface having an associated first width (w1) and said output surface having an associated second width (w2), said first width (w1) being substantially equal to a diameter of said cylindrical lens; and

an optical fiber adjacent said output surface of said coupling element, said second width (w2) of said output surface of said coupling element being substantially equal to a diameter of said optical fiber.

More particularly, Lang does not teach a lighting apparatus comprising a cylindrical lens along with a wedge-shaped coupling element that is positioned at a distance from the cylindrical lens for thereby receiving collimated light directly from the cylindrical lens, as claimed and required in Applicants' independent claim 13. Instead, as mentioned hereinabove, Lang specifically teaches interposing an optical beam reconfiguring device (designated 10 in Figure 20 of Lang) between a cylindrical lens (designated 53 in Figure 20, 63 and 64 in Figures 21 and 22, and 73 in Figure 23 of Lang) and a converging lens system (designated 80 in Figure 25 of Lang). Again, such a teaching by Lang is contrary to the purpose and intent behind Applicants' invention of avoiding the need to precisely position and align multiple lenses and optical elements. (Applicants, ¶ 0010; and ¶ 0033). As with Lang, Hosokawa too does not teach a lighting apparatus comprising a cylindrical lens along with a wedge-shaped coupling element that is positioned at a distance from the cylindrical lens for thereby receiving collimated light directly from the cylindrical lens, as claimed and required in Applicants' independent claim 13. Therefore, Lang and Hosokawa, either alone or in combination, neither teach nor suggest Applicants' invention as presently claimed in independent claim 13.

In view of the disparate teachings of both Lang and Hosokawa discussed hereinabove, Applicants respectfully maintain that the combination of Lang and Hosokawa does not render obvious Applicants' invention as presently claimed in independent claim 13. Furthermore, given that claims 14-17 are dependent on



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independent claim 13, Applicants further maintain that the subject matter of dependent claims 14-17 is not rendered obvious either.

With regard to the obviousness rejection of independent claim 18, Applicants maintain that the combination of Lang and Hosokawa does not render obvious Applicants' claimed invention. In particular, with regard to Applicants' independent claim 18 as amended, Lang and Hosokawa, either alone or in combination, neither teach nor suggest:

[a] method of coupling the output of a linear diode laser array into an end of an optical fiber, said method comprising the steps of:

optically coupling along a linear axis spaced at a first distance (d1) from said linear diode laser array a cylindrical lens having a length substantially equal to a length defined by said linear diode laser array, said cylindrical lens receiving emitted light from a plurality of diode lasers within said linear diode laser array and collimating said light;

directly optically coupling the collimated light from said cylindrical lens and into a wedge-shaped coupling element having an input surface and an output surface, said coupling element positioned at a second distance (d2) from said cylindrical lens and having a length (L) extending from said input surface and to said output surface, said coupling element having a height (h) and said input surface having a radius of curvature along said height (h), said height (h) being substantially equal to said length of said cylindrical lens, said coupling element tapering from said input surface and to said output surface, said input surface having an associated first width (w1) and said output surface having an associated second width (w2), said first width (w1) being substantially equal to a diameter of said cylindrical lens; and

optically coupling light from said output surface of said coupling element and into an end of the optical fiber, said optical fiber having a diameter substantially equal to said second width (w2).

In particular, Lang does not teach a light coupling method comprising the step of directly optically coupling collimated light from a cylindrical lens and into a wedge-shaped coupling element, as claimed and required in Applicants' independent claim 18. Instead, as mentioned hereinabove, Lang specifically teaches interposing an optical

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beam reconfiguring device (designated 10 in Figure 20 of Lang) between a cylindrical lens (designated 53 in Figure 20, 63 and 64 in Figures 21 and 22, and 73 in Figure 23 of Lang) and a converging lens system (designated 80 in Figure 25 of Lang) for delivering light. Again, such a teaching by Lang is contrary to the purpose and intent behind Applicants' invention of avoiding the need to precisely position and align multiple lenses and optical elements. (Applicants, ¶ 0010; and ¶ 0033). As with Lang, Hosokawa too does not teach a light coupling method comprising the step of directly optically coupling collimated light from a cylindrical lens and into a wedge-shaped coupling element, as claimed and required in Applicants' independent claim 18. Therefore, Lang and Hosokawa, either alone or in combination, neither teach nor suggest Applicants' invention as presently claimed in independent claim 18.

In view of the disparate teachings of both Lang and Hosokawa discussed hereinabove, Applicants respectfully maintain that the combination of Lang and Hosokawa does not render obvious Applicants' invention as presently claimed in independent claim 18. Furthermore, given that claims 19 and 20 are dependent on independent claim 18, Applicants further maintain that the subject matter of dependent claims 19 and 20 is not rendered obvious either.

### **CONCLUSION**

In view of the foregoing remarks, Applicants respectfully submit that independent claims 1, 4, 6, 13, and 18 as amended, as well as claims 2, 3, 5, 7-12, 14-17, 19, and 20 dependent thereon, are both novel and nonobvious with respect to the disclosures and teachings of Lang and Hosokawa. Therefore, Applicants respectfully request that Examiner's rejections under 35 U.S.C. § 103(a) be withdrawn and that a Notice of Allowance be issued therefor.

Entry and reconsideration of the claims as herein amended is respectfully requested under 37 C.F.R. § 1.116 in view of Examiner's newly introduced and detailed comments in the August 10, 2004 Office Action marked as being "FINAL." At the very

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least, in submitting this proposed Amendment within two months of the mailing date of the Office Action, Applicants hereby respectfully request an Advisory Action from Examiner and that these amendments be entered.

Should the Examiner have any questions with respect to any matter now of record, Examiner is invited to contact Applicants' undersigned attorney at (248) 223-9500.

Respectfully submitted,

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